REMARKS

Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

Status of the Application

Claims 1-16 are currently pending in the application. Of these claims, claims 1 and 3 are currently amended, claim 6 is original, and claims 2-5 and 7-16 were previously presented. Claims 1, 3, 6, 9, 13, and 16 are independent. No new matter has been introduced into the application by way of the aforesaid amendments.

Summary of the Office Action

The Office Action opens by rejecting claims 1-5, 10, and 16 under 35 U.S.C. §112 for recitation of a "single means," citing MPEP §2164.08. The Office Action next rejects claims 1, 2, 4-9, and 13-15 under 35 U.S.C. § 102(b) as anticipated by EP Published Application No. 1 247 654 A1 to Kaerts et al. (hereinafter "Kaerts"). It thus appears that claims 3, 10-12, and 16 stand rejected only under §112 as discussed above.

Discussion

Regarding the IDS submitted on June 23, 2004, and resubmitted on January 5, 2006, it appears from PAIR that the IDS has been considered. However, an initialed copy of the PTO-1449 form was not forwarded to Applicants with the Office Action. Applicants again respectfully request that the initialed PTO-1449 form be forwarded to them.

Regarding the rejections of claims 1-5, 10, and 16 under 35 U.S.C. §112 for recitation of a "single means," citing MPEP §2164.08, the recited MPEP section simply prohibits claims that contain a <u>single</u> element <u>if</u> that element is a means recitation. It does not imply that, regardless of the number of elements that a claim may have, any means element has to be accompanied by another means element. None of the rejected claims1-5, 10, and 16, regardless of the present amendments, consists of only a single element, let alone a single element that is also a means recitation. Accordingly, it is respectfully requested that the rejections under §112 be withdrawn.

Turning to the art rejections, Applicants submit that Kaerts does not disclose, nor teach or suggest, the subject matter set forth in the independent claims. For the reader's convenience, the independent claims are reproduced below with emphasis:

1. A thermal head printer with ***image-invariant printing speeds*** for printing a substantially light-insensitive thermographic material having a print density-driving power level characteristic, said thermal head printer comprising a means of transporting said substantially light-insensitive thermographic material through said printer, one or more thermal heads each having an array of heating elements, a thermal print head drive system capable of supplying power to each of said printing elements, and a means of performing a ***calibration based on said print density-driving power level characteristic of said thermographic material.***

3. A thermal head printer with ***image-invariant printing speeds*** for printing a substantially light-insensitive thermographic material having a print density-driving power level characteristic, said thermal head printer comprising a means of transporting said substantially light-insensitive thermographic material through said printer, one or more thermal heads each having an array of heating elements, a thermal print head drive system capable of supplying power to each of said printing elements, and a means of performing a ***calibration based on said print density-driving power level characteristic of said thermographic material***, wherein the driving power level in said print density-driving power level characteristic of said thermographic material is rendered dimensionless by normalization.

6. A process for calibrating a thermal head printer with ***image-invariant printing speeds***, said thermal head printer comprising one or more thermal heads each having an array of heating elements connected to a power supply capable of supplying a given number of heating element driving power levels from 0 to a maximum driving power level number, corresponding to P_{max}, to each heating element for printing a substantially light-insensitive thermographic material by image-wise heating said thermographic material with said heating elements, said process comprising the steps of:

(i) putting said printer into a calibration mode;

(ii) printing one or more step-wedges of print densities by heating said thermographic material with said heating elements at different DPLN's;

(iii) ***determining the optical density of each step of said step-wedge(s) of print densities with a densitometer thereby obtaining the dependence of said print density upon DPLN;***

(iv) deriving from said dependence, or all said dependences of said print density upon DPLN, a single smoothed dependence of the rate of change of print density, D, with DPLN, $\Delta D/\Delta DPLN$, as a function of DPLN for said thermographic material;

(v) establishing a threshold rate of print density change per DPLN for the specific thermographic material being printed; and

(vi) setting up said thermal head printer so that said threshold rate of print density increase per DPLN cannot be undercut.

9. A process for printing a substantially light-insensitive thermographic material with a thermal head printer with ***image-invariant printing speeds***, said thermal head printer comprising one or more thermal heads each having an array of heating elements connected to a power supply capable of supplying a given number of heating element driving power levels from 0 to a maximum driving power level number, corresponding to P_{max}, said process comprising the steps of: calibrating said thermal head printer, transporting the substantially light-insensitive thermographic material past the thermal head, and image-wise heating of the substantially light-insensitive thermographic material by means of said heating elements, wherein said calibration comprises the steps of:

(i) putting said printer into a calibration mode;

(ii) printing one or more step-wedges of print densities by heating said thermographic material with said heating elements at different DPLN's;

(iii) ***determining the optical density of each step of said step-wedge(s) of print densities with a densitometer thereby obtaining the dependence of said print density upon DPLN;***

(iv) deriving from said dependence, or all said dependences of said print density upon DPLN, a single smoothed dependence of the rate of change of print density, D, with DPLN, $\Delta D/\Delta DPLN$, as a function of DPLN for said thermographic material;

(v) establishing a threshold rate of print density change per DPLN for the specific thermographic material being printed; and

(vi) setting up said thermal head printer so that said threshold rate of print density increase per DPLN cannot be undercut.

13. A process for calibrating a thermal head printer with ***image-invariant printing speeds***, said thermal head printer comprising one or more thermal heads each having an array of heating elements connected to a power supply capable of supplying a given number of heating element driving power levels from 0 to a maximum driving power level number, corresponding to P_{max}, to each heating element for printing a substantially light-insensitive thermographic material by image-wise heating said thermographic material with said heating elements, said process comprising the steps of:

(i) putting said printer into a calibration mode;

(ii) printing one or more step-wedges of print densities by heating said thermographic material with said heating elements at different DPLN's;

(iii) ***determining the optical density of each step of said step-wedge(s) of print densities with a densitometer thereby obtaining the dependence of said print density upon DPLN***;

(iv) deriving from said dependence, or all said dependences of said print density upon DPLN, a single smoothed dependence of the rate of change of print density, D, with DPLN, $\Delta D/\Delta DPLN$, as a function of DPLN for said thermographic material;

(v) establishing a threshold rate of print density change per DPLN for the specific thermographic material being printed; and

(vi) setting up said thermal head printer so that said threshold rate of print density increase per DPLN cannot be undercut,

wherein the driving power level in said print density-driving power level characteristic of said thermographic material is rendered dimensionless by normalization.

16. A process for printing a substantially light-insensitive thermographic material with a thermal head printer with ***image-invariant printing speeds***, said thermal head printer comprising one or more thermal heads each having an array of heating elements connected to a power supply capable of supplying a given number of heating element driving power levels from 0 to a maximum driving power level number, corresponding to P_{max}, said process comprising the steps of: calibrating said thermal head printer, transporting the substantially light-insensitive thermographic material past the thermal head, and image-wise heating of the substantially light-insensitive thermographic material by means of said heating elements, wherein said calibration comprises the steps of:

(i) putting said printer into a calibration mode;

(ii) printing one or more step-wedges of print densities by heating said thermographic material with said heating elements at different DPLN's;

(iii) ***determining the optical density of each step of said step-wedge(s) of print densities with a densitometer thereby obtaining the dependence of said print density upon DPLN;***

(iv) deriving from said dependence, or all said dependences of said print density upon DPLN, a single smoothed dependence of the rate of change of print density, D, with DPLN, $\Delta D/\Delta DPLN$, as a function of DPLN for said thermographic material;

(v) establishing a threshold rate of print density change per DPLN for the specific thermographic material being printed; and

(vi) setting up said thermal head printer so that said threshold rate of print density increase per DPLN cannot be undercut,

wherein the driving power level in said print density-driving power level characteristic of said thermographic material is rendered dimensionless by normalization.

As can be seen, each claim relates to allowing image-invariant printing speeds in combination with a calibration that is based on the print density/driving power level characteristics of the thermographic material.

Although the claims do not necessarily require it, and solely for purposes of the reader's edification, the claimed technique can allow, among other advantages, a reduction in premature failure of the heating elements and image faults in the thermographic materials due to overheating.

As discussed in applicants' specification, the prior art generally suggests reducing the printing speed as a way of reducing element failure and image faults. Moreover, Kaerts itself does not teach or imply that the technique therein employs or even allows image-invariant printing speeds.

Moreover, as noted via the emphasis in the claims above, each independent claim recites elements related to a calibration that is based on the print density/driving power level characteristic of the thermographic material. The Kaerts claims (*see*, claim 1) and disclosure (*see, e.g.*, col. 4, line 38 to col. 5, line 2) relate to:

> A method for calibrating a thermal printer comprising a thermal head incorporating a plurality of energisable heating elements, said method comprising the steps of: supplying to said thermal printer a thermographic material m, a plurality of printer data P_i each intended to be recorded as a pixel having a density D_i, and default reference values for printing parameters π comprising a value Pref for a reference printing power; printing a calibration pattern for said plurality of printer data P_i, said calibration pattern comprising a multiple step density wedge such that a whole range of a relation D_i (P_i) between said printer data $P_i$and said density D_i is covered; measuring a density $Dexp_i$ for each patch of said density wedge of said calibration pattern in relation to said plurality of printer data P_i and storing a set S1=(Pref, P_i, $Dexp_i$) in a first memory M_1; calculating, for a desired density $Dwant_j$, a corresponding value $Prefnew_j$ for said reference printing power and storing a set S_2=($Dwant_j$, $Prefnew_j$)in a second memory M_2; and calculating, for said desired density $Dwant_j$, for each printer data P_j a corresponding density D_j and storing a third set S_3=($Dwant_j$, $Prefnew_j$, P_i, D_i) in a third memory M_3.

The technique of Kaerts as reflected in the above claim and the corresponding section of the Kaerts specification, ***does*** relate to calibration, but clearly ***does not*** relate to, disclose or imply image invariant printing speeds in combination with calibration of the drive characteristics of the heating elements for the specific thermographic material on the basis of the print density-driving power level characteristics as required by the pending claims.

The Office Action cites the Kaerts abstract as teaching image invariant printing speeds. However, the Kaerts abstract makes no mention whatsoever of printing speed. The Action cites 22 full paragraphs (and figures 1-2) generally as teaching the limitations of claim 1, including the calibration means. However, for example, the cited section in its entirety does not appear to teach the cited limitations, including the calibration means as recited. If the rejections are maintained, some degree of clarification is requested regarding where the alleged teachings are to be found with the cited 22 paragraphs and/or figures.

Because a rejection under §102 is proper only when each and every claim limitation is taught in the asserted reference, and because Kaerts fails to teach at least a number of limitations of each claim as discussed above, Applicants respectfully request withdrawal of the rejections of independent claims 1, 3, 6, 9, 13, and 16 and dependent claims 2, 4-5, 7-8, 10-12, and 14-15.

Moreover, the additional elements recited in the dependent claims are also in most cases not taught by the cited reference. Applicants reserve the right to further elaborate if and when it becomes appropriate.

Conclusion

Applicants believe the application is in proper condition for allowance, and the Examiner is respectfully requested to pass the application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

Phillip M. Pippenger, Reg. No. 46,055
LEYDIG, VOIT & MAYER, LTD.
Two Prudential Plaza, Suite 4900
180 North Stetson Avenue
Chicago, Illinois 60601-6780
(312) 616-5600 (telephone)
(312) 616-5700 (facsimile)

Date: August 4, 2006